LINCOLNSHIRE

NATURALISTS' UNION.

TRANSACTIONS, 1939-1942.

VOLUME TEN.

EDITED BY F. T. BAKER, F.R.E.S. & A. ROEBUCK, N.D.A., F.R.E.S.

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Lincolnshire Naturalists' Union Transactions.

1940

Edited by
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F.R.E.S.
AND
A. ROEBUCK,
N.D.A., F.R.E.S.

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Lincolnshire Naturalists' Union.

Founded June 12th, 1893.

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STATEMENT OF ACCOUNT from January 1st to December 31st, 1940.

GENERAL FUND.

RECEIPTS.	£	s.	d.	PAYMENTS.	£	s.	d.
Balance in Bank, 1st January, 1940	2	0	2	Printers' Account for Notices of Meetings, Stationery, etc.	0	18	6
Members' Subscriptions	42	0	6	Postages and small payments	6	5	10
				Grant to Publication Fund	16	7	6
				Balance in Bank, 31st December, 1940	20	8	10
	£44	0	8		£44	0	8

PUBLICATION FUND.

	£	s.	d.		£	s.	d.
Donations to Publication Fund	8	15	0	Printer's Account for "Transactions"	25	0	0
Sale of Transactions	0	10	0	Block for Diagram	0	12	6
Grant from General Fund	16	7	6				
	£25	12	6		£25	12	6

SEPARATE ACCOUNT.

Life Members' Subscriptions invested in P. O. Savings Bank.

	£	s.	d.		£	s.	d.
Amount shown on Balance Sheet, 1939	105	2	3	Income Tax, 1940—1	0	17	0
Interest for 1939	2	12	6	Balance on 31st December, 1940	106	17	9
	£107	14	9		£107	14	9

Lincolnshire Naturalists' Union.

Presidential Address

Delivered at Lincoln, November 23rd, 1940,

BY

R. Wood Powell, L.D.S.

BIRD PROBLEMS.

First of all I have to thank you most heartily for having elected me as your President. It is a great honour and one that I appreciate all the more in that I realize that I am the very first one who has not been a specialist in some branch of Natural History. Before I have finished this paper you too will realize this, but I hope that you will not too greatly regret it. When I think of my long association with the Lincolnshire Naturalists' Union I marvel at all the knowledge and joy I have had from that association, and if I can do a very little towards returning the compliment or giving a little of it to others I shall be more than satisfied. When I was asked to let my name go forward my first thought was to refuse. I thought of all the past presidents, each one an authority, and of all the wonderful papers they have given you in their Presidential addresses and I was frightened. I thought of my first field meeting many years ago and of the members present at the meeting, each one specializing in his or her subject and leaving me to feel very small and very ignorant, and I was still more afraid to try and follow their example. But then I began to remember many more field meetings and how, as my shyness wore off, I found that these dread authorities were very human; ready to take pity on my ignorance, and to share their knowledge and so eager to do so, that I began to

look forward to the meetings as some of the brightest spots of my life, and I began to look for kindred spirits of my own to come and share with me the joys that the specialists were always only too ready to give us. Soon we gathered a nucleus of those who had no particular subject to specialize in, but only a great love of all things natural and therefore beautiful. Thinking back on these lines I wondered if after receiving so much from the Union, it was not time that I did something for it, so I let my nomination go forward and you must be the judges as to whether I have failed or whether I have in some slight measure justified your choice. But before I leave this part of my paper I must pay tribute to all these men and women who have made the L. N. U. Has any Society or Association ever been able to show a greater or better list of authorities than we have? From John Cordeaux, our first President, to our last, they have all loved their subjects and have spoken with real authority on them, and we have been the gainers, so let us pause now and again to think of them and of the work they have done. Also when we pause, let us think how few they are now in number and let us realize that unless we can get others to replace them, their loss will be irreparable. Our membership is greater than ever, but our specialists are becoming fewer. There is no need to stress the significance of this and I say to you now that it is urgent that some of you younger members should begin to specialize so that you can take up the work of some who have gone and of some who are not likely to carry on much longer. The Union must not be allowed to become entirely one of amateurs. We have room for them and will always welcome them. Present-day conditions do not always allow time for deep study and so the class to which I belong and to which I have referred as amateurs is an ever growing one, and to me this is one of the best signs of the times, but let us not forget that, primarily, the Union is a scientific one, and so the scientists must be our very life-blood. I should like to see more young members of senior school age. Surely some of these could be trained if

caught young enough, and we still have a sufficiency of our glorious 'old gang' to put them in the right way. Will you please remember this point and do all you can to help? In this connection, I should like to say that I think we are extremely lucky in our secretary and I feel sure that he will wisely advise anyone who thinks of specializing as to what books to get and generally give them all the help he can. One thing before passing on to my subject, I should like to claim the President's privilege of thanking him for all he has done for the Union and for me. From the time he first came to the Museum I have watched him and I feel that I have perhaps greater knowledge than most of you of what he has done. I have seen great changes in the Union and I know how hard he has worked and how carefully he has steered us through awkward times, and I now take this opportunity of publicly thanking him in your name for all of it.

And now for my paper which really scarcely deserves the name of paper, as I propose merely to suggest firstly certain thoughts that have occurred to me as being of interest, and these I hope will give us opportunity for a healthy and helpful discussion later on, and secondly, to give you some idea of the birds of our county from the historical point of view, when I hope to be able to show you that Lincolnshire must at one time have been one of the most favoured of spots for birds of all kinds.

So here are some queries, and I hope that some of you will be able to provide the answers.

Let us start with the bird and its egg.

We all know that different birds lay eggs of different sizes, shapes and colours, and we are all aware of the fact that size also gives some indication of the degree of development of the chick when it hatches. We also know that the egg laid in an exposed position is generally more pear-shaped than one laid in a deep or cup-shaped nest and we know that birds which lay white eggs, generally do so in a very dark and well concealed position or else are hard-sitters and protectively

coloured themselves, but why should so many eggs be beautifully and brilliantly coloured? Many of our hedge-row eggs are very lovely to look at, but no one can claim that the Thrush's or Hedge-Sparrow's for instance are protectively coloured. I cannot think that the colour is there to guide the bird to her own nest, as that same colouring would serve equally well as a guide to her enemies, and I cannot visualize Mrs. Thrush flying into the hedge at any point and then hopping along looking for her own home. No, she flies to the place itself, wlthout hesitation. Neither does it seem to me to be any question of personal adornment. Personal adornment and song belong to the mating season, and are purely a measure for attracting the females, so there is no further necessity for this once nest-building has commenced.

The question of bird migration too is still largely a mystery. Is long distance migration carried out in long 'non-stop journeys' or in a series of 'short hops'? I think it must be a combination of the two. Heinrich Gätke writing about the end of last century, raises some very interesting points in this direction. He spent all his life observing birds on Heligoland and his notes on the Red-spotted Bluethroat made a great impression on my mind when I first read them 30 years or so ago. He says it is well established that they leave the North Coast of Africa at sunset and (from his own observation) they arrive in Heligoland at sunrise and during migration time they are practically unknown on the route between. Therefore, they must travel for a day and two nights or else complete the journey in one short night. This, according to his estimate, means an average speed of 280 miles an hour. This conclusion seems to Gätke to be the most likely one and to account for it he advances what was then the startling theory that birds travelled high up at an unthought-of altitudes in strata where the wind was a following one. I believe that most authorities since then have

scoffed at this idea,* but to me the results of some investigations into the substratosphere carried out by means of balloons at Cranwell were very significant. Ground velocities and wind direction bore no relation to those at great altitudes. For instance, at ground level the wind may be slight and from one direction whereas at say 5000 ft. it may be of gale force and from a totally different point. Peter Scott also quotes the case of a Hindu scientist photographing the sun's disc in the Himalayas, who found a series of dots on his developed plates. Enlargement showed the dots to be geese flying across the disc itself and computations worked from known points on the photograph showed them to be travelling at about 26,500 ft. or roughly 5 miles high.

It is also instructive to find that the American Air Service has been watching the long distance North-South and South-North migration on that continent and that their observers are inclining to the theory that a great deal of it takes place in the substratosphere. Birds with their hollow bones have their own oxygen apparatus and as far as their feathery covering is concerned they are as completely equipped as the most scientifically clad height specialist. Gätke by observing the time of departure of Hooded Crows and John Cordeaux by observing their arrival on the Humber, established that they travelled at 108 miles per hour at ordinary heights, under ordinary conditions, so what rate of travel can be achieved with a following wind of say over 100 m.p.h., I for one should not like to say. Migration as a whole is such a marvellous affair that the more one thinks of it, the more breathless and bewildered one is left. How does the Goldcrest, the tiniest of all our birds except his cousin the Firecrest, manage to

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*A. Landsborough Thomson in "Problems of Bird Migration" writes of Gätke—

"One must not be ungrateful to the man who has given the subject a mass of data of all sorts representing the work of a lifetime devoted to ornithological observation, but on these points his evidence, at best mainly circumstantial, can hardly be accepted in the light of the more exact knowledge now available."

"In the light of other observations one can only say that either his judgement or his methods must have been seriously at fault."

cross the North Sea year after year? One hears of numbers of them occasionally coming to rest on some ship half way across, but they can only represent a very small fraction of the whole. There is also evidence to show that some of them manage to get a lift on larger birds, but the bulk of them must do so by their own unaided efforts. It might interest you too, to hear what Gätke says in his book about the migration of this wee mite. Writing of the year 1882 he says: "The earliest individuals arrived on 8th September and the migration proceeded with occasional interruptions in moderate numbers throughout the month. With the approach of October, however, a considerable increase in the number of migrants took place, the birds appearing daily in very large numbers, and on the night of the 28th the migration assumed such vast dimensions that even an approximate computation of their numbers was quite out of the question. Perhaps the simile of a snowstorm might help to convey an idea of the scene. From ten at night until day-break the birds sped steadily from east to west past the lighthouse, appearing under the bright glare of the lantern like so many real snowflakes driven by the wind. By day-break the whole island was literally covered with the birds, but by ten o'clock in the morning the majority had again proceeded on their journey. It must not, however, be assumed that a migration of this kind consists of a narrow stream of birds attracted by the glare of the lighthouse or that it is because Heligoland happens to lie on one of the supposed migration routes—for such is not the case. The birds observed here under these conditions were only a fraction of the migration column of the species, covering a breadth from north to south equal to the latitudinal extent of its breeding stations. This is proved by the fact that, throughout the whole of October of that year, a similar unprecedented migration of the same species, repeatedly increasing to vast hordes like those seen in Heligoland, was reported from all stations on the East Coast of Gt. Britain, from Guernsey, northwards to Bressay, the central Island of the Shetland Group; representing a migration column of nearly 680 geographical miles

in width". I think you will all agree that here we have something as wonderful as anything nature can provide. The only thing I can compare it with is the constant migration of butterflies across the North Sea, but this takes place in the Summer under infinitely better meteorological conditions, indeed, it can only be possible under very favourable wind conditions, while the Goldcrests sometimes seem to cover it under quite adverse circumstances.

Another question which has made me wonder many times is this: Are birds in general tending to adapt themselves to town life more than they used to? It sometimes seems to me that there is a definite tendency on their part to come more and more into the towns. The records published occasionally of birds nesting in and haunting the big parks of London and other towns is enough to make any ornithologist's mouth water. Rare species such as the Tufted Duck and Pochard nest regularly in St. James' Park, and such diverse species as the Kingfisher, Owls, Nuthatch, etc., are all well known in the metropolitan area. Within the last year or two I have heard the Tawny Owl night after night in a garden a few yards away from my house, and a Little Owl has nested regularly in a paddock opposite during the whole time I have lived there, while I have also heard the Barn Owl within half a mile or so. A Great Spotted Woodpecker also visited a bird table each day for several weeks in the 1937-38 winter and was joined for a few days in the Spring by her mate, before she finally left to seek a nesting site elsewhere. The Black-headed Gulls are now part of the winter life of most of our towns and yet they have only been so for a comparatively short time, and so have the Wood-pigeons which are such a feature of the London parks. Here in Lincoln, Brayford and the adjoining stretches of the Witham and Foss Dyke often provide us with interesting and sometimes rare visitors. During the winter I have seen Kingfishers perched on the houseboats on the Pool, and very out of place they looked in those dingy surroundings. I have also seen the Common Tern, Tufted Duck and Common

Scoter on the water there and a Great Crested Grebe has been known to stay several weeks on the Foss a little higher up, while one of the rarer grebes was seen but unfortunately, not definitely identified Sometimes, too, on a misty morning one could dimly discern an old Heron looking like a slender grey ghost, standing on the island.

The Pied Wagtail which always seemed to me a bird of the streams when I was a boy, now seems to be much more catholic in his tastes and seems as much at home with his family on my lawn as ever he used to be on the banks of the stream I used to know as a boy.

We who live in Lincolnshire must count ourselves lucky in that we have such a diversity of types of country to attract a wide variety of birds. Our fen country still provides us with big flocks of all kinds of gulls, waders, duck and geese, but what it must have been like before the drainage is hard to imagine. Old records speak of the Cranes and Avocets, the Spoonbills and the Bitterns as being common. yet now, alas, they have left us except for an occasional visitor. Where are the hordes of Ruffs and Reeves which in the first 20 years of the 19th century were said to have covered the banks between Clee and Tetney, so tired that one could knock them over with a stick? Increase of drained areas and a consequent bigger building up of these areas has, I am afraid, robbed us for ever of them. Reading through old papers I was surprised to find that 150 years or so ago a great part of wilder Lincolnshire was given up to rabbit farming on a large scale. The old moorland made ideal sites for these farms and also provided harbourage for a number of interesting birds. Lincolnshire in former days could be divided into many types of country each with its own peculiar types of bird. The coastland with its gulls and waders remains less changed than any other section, but the fens have been drained and the great wastes have been brought under cultivation, and so to a great extent have the wolds. Each possessed its own characteristic birds. The fens with its Herons, Bitterns, Ruffs and Reeves, Avocets, Cranes and Spoonbills, its ducks

and geese must have been an ornithological paradise. It still provides us with a number of our more interesting species. I wonder how many of you are aware of the immense tracts of waste lands which extended through the county until the middle of the 18th century; from the south of the county, through Kirton Lindsey to Barton-on-Humber, with another large area below Caistor. Some of you will remember the area around Scotton and Scotter before it was drained and afforested. There we had almost the last of the old wastes and what a hunting ground it was. When I knew it as a boy it was dominated of course by the Black-headed Gull, but he was only a comparative new-comer, who had not been resident for more than 40 or 50 years at that time. Partly high, sandy and dry, the haunt of the Wheatear and the Stock-dove and hundreds of small birds, and partly low, almost bog except in very dry seasons, with numerous 'flashes' and ponds, what a variety we used to see there! Besides the gulls there were Shelduck, Pochard, Mallard, Curlew, Snipe, Redshank, Herons, and parts of it still provide the last harbourage in Lincolnshire of the Black-cock. In earlier days it also sheltered the harriers, the Short-eared Owl and other birds of prey.

The Wolds too in their earlier days saw the Great Bustard, Stone-Curlew and Dotterel as nesting species.

In the marsh, the Hen-harrier, the Spotted Crake, Ruffs and Reeves, while in the adjoining woodlands such birds as the Kite, Buzzard and Hobby still lingered with us until the middle of last century. A few old records will show what I mean. In 1750 the birds of prey, such as the harriers, were so common on the open moor-land between Caistor and Spilsby that in some places there were as many as ten pairs to the acre. In 1798 on the Wolds the last Great Bustard was shot in a Thoresby field and sent to Sir Joseph Banks. In 1670 an extract from an old account book of Charles Anderson: "October 23 to Thomas Beckitt for killing two Bustards 2/-". A letter from the great Dr. Johnson to his friend Benet Langton of Langton thanked him for a parcel of game which included a Bustard. An old record (undated)

records a flock of duck flying from N. and N.E. to E. in a continuous stream for 8 hours.

The drainage of the fens caused the disappearance as resident species of our Harriers, Short-eared Owls, many of our Ducks, Cormorants, Grebes, Divers, Bitterns, Cranes, Spoonbills, Storks, Black-tailed Godwits, Avocets, Ruffs and Reeves, and Terns except for the Lesser, and yet recent county records of such interesting birds as the rarer Grebes in the winter and the Tufted Duck as a nesting species have led me to wonder whether there is not always a tendency among birds to return to their ancestral haunts, even when they have to adapt themselves to changed conditions, and I can yet visualize the day when some of our lost breeding species will again take up regular residence with us. I feel certain that the Shelduck is on the increase as a nesting species in the county, and I hope that we may yet see the return of a great number of our now extinct birds, but I fear that the development of Lincolnshire as one of our foremost agricultural counties has been responsible in part for the loss of an incredible number of vastly interesting species. Ignorance and thoughtlessness is going to lose us far more if we will not be forewarned. In one year ten decoys around Wainfleet sent 31,300 ducks to London, and the record of the Ashby Duck Decoy makes interesting reading. In the years from 1833 to 1865, 87,674 ducks were taken, an average of 2739 birds each year. This from one decoy only. Small wonder is it, that our wild fowl flocks decreased. The duck decoy is now a thing of the past and the improvement of the land must go on, but many other factors contribute to a diminution of the number of our birds and unless we make a determined effort to stop some of these abuses we and our children will be the ultimate losers, in that we and they will be left to deplore a still longer and growing list of 'Extinct Birds of Lincolnshire'. I have no grumble against the real long-shore shooter. A man who takes a gun and is willing to undergo a considerable amount of discomfort to shoot something for the pot is not to be sneered at, but for the man or youth who puts so many cartridges into his pocket

and is determined to blaze them away at all costs, I would have no mercy. This man or youth admittedly goes out to shoot duck primarily, but if no duck present themselves he must and will blaze away at anything that presents itself. Our coasts during the shooting season tell a sorry tale with their mangled corpses of what I mean. Such people should be jumped on and jumped on hard. A small fine is very little deterrent and confiscation of the gun for a time is the only punishment I can think of to actually fit the crime.

For the sportsman who shoots anything that is new or rare, I also have nothing but the greatest contempt, but the man who really makes me see red is the collector who employs another man to get him a clutch of eggs of some rare bird, perhaps just trying to re-establish itself. This man, with plenty of money, runs no risk. Even if his agent is caught it is he who appears before the local bench and the collector's name does not appear at all, and so he gets away without even his neighbour's contempt. Even if a smart fine is inflicted his pocket will stand it, and unless it be accompanied by confiscation of the eggs or bird it is no deterrent at all. This practice, I am glad to say, is being adopted by more benches of magistrates all over the country, but the only way to eradicate the evil is to make it just one of the things that is not done, and there we of a Naturalists' Union have a tremendous responsibility to future generations. It is up to us to feel strongly about such things, so strongly that we cannot help preaching our gospel wherever we go. The growth of our own Union shows the increasing interest taken in all things pertaining to our countryside. Let us of this generation do all we can to preserve it for those to come, and in so doing we ourselves will feel greater enjoyment of it.

One other thing I should like to do before I finish. I should like to put in a plea for the gamekeepers. Some bird and animal lovers seem to regard him as a natural enemy. I grant that in many cases his interests and ours clash and that then the keeper may do something which we regret, but please remember that he has a job of work to do and that is to pro-

vide a head of game for his employer, and if he is going to keep that job he must do all in his power to fulfil his obligations. He cannot, for instance, allow access to his preserves in the nesting season even to bona fide naturalists. Also he may think it necessary to destroy some raptorial bird which has taken up its quarters too near his domain. However much we may regret it, do not let us judge too harshly, and let us be thankful that the list of owners who are willing to sacrifice their birds to some extent in order to preserve a rare one, even when it is definitely destructive, is a growing one. The time should come if we continue to preach our gospel when it will be a point of honour among all land owners to cherish our rarer birds, and the same will then automatically apply to gamekeepers and other employees. They will be proud to say that a rare species has enjoyed their hospitality or has even stayed with them to nest and rear their young, and then we can perhaps look forward to the return to our country of some of our extinct birds. If we as members of this Union of ours can feel in any small degree that we have contributed to such a happy state of affairs, I think that John Cordeaux and the others of our founders will rest, assured that we as a Naturalists' Union have done something to justify our existence.

In conclusion, I should like to thank you for listening so patiently to me. I had intended to give you far more, but the advent of the war besides spoiling all our outdoor activities gave most of us other work to do, and I have not been able to give the time to the research work I had intended when you first did me the honour to elect me your President.

A SHORT OUTLINE OF THE STRATIGRAPHY OF THE LINCOLNSHIRE LIMESTONE.

By P. E. Kent, Ph.D., F.G.S.

At the Annual General Meeting the writer briefly outlined the succession and the lateral changes in the Inferior Oolite

Lincolnshire Limestone, and went on to demonstrate a structural contour map showing the disposition of the bed down dip to the east beneath the Fenland. In the following note the former subject will be described, with the object of explaining the relationship of different beds and their lateral changes, particularly in thickness. It is hardly necessary to point out that this short account is by no means complete, even to the extent of present knowledge, but the presentation of a summary in advance of the detailed descriptions of sections which will one day be published, may meet the needs of those whose interests are less specialized.

The writer carried out a general reconnaissance of the limestone in 1932-6, and has since had opportunities for detailed examination of particular areas. This led, in particular, to the recognition of the widespread character of a thin bed with *Acanthothyris crossi*, forming a useful datum, and to the realization that the nonsequence at the base of the Great Oolite Series amounts locally to angular unconformity. Meanwhile, Mr. Linsdall Richardson extended northwards his work on the Inferior Oolite of the Midlands, being able, from his great experience, to recognize fine subdivisions and the presence of minor breaks within the Limestone. The subdivisional names used below have been determined in discussion with him.

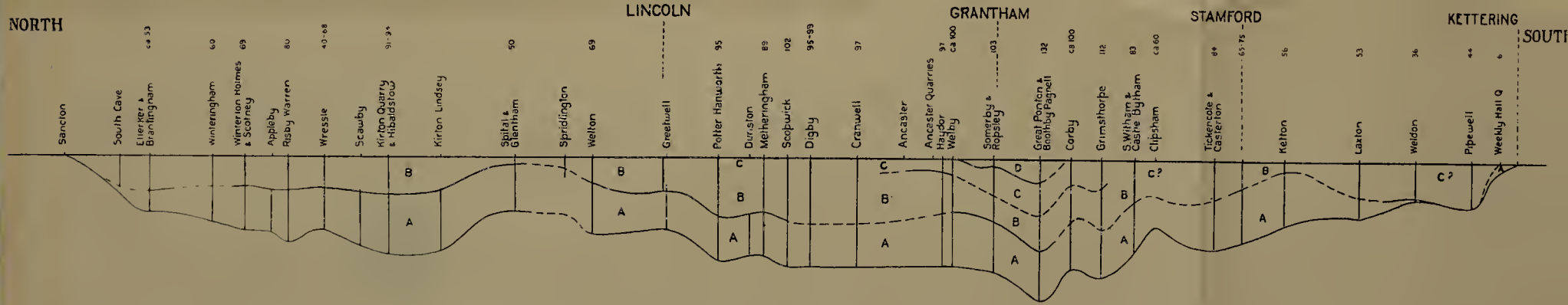
Succession.—The general sequence of the beds may first be briefly outlined. The lowest horizon of the limestone is the Collyweston Slate, sands with lenticular masses of fissile siliceous limestone, containing a characteristic gastropod, *Phyllocheilus* (formally "*Pterocera*") *bentleyi*, with *Gervillia acuta*, *Pinna cuneata*, etc. These beds are thick in north Northamptonshire, but occur also in mid Lincolnshire. Above comes 3-5 feet of very hard blue sandy and ferruginous brown-weathering limestone, with flattened pale ooliths in some developments, known as the Blue Beds. *Gervillia* cf. *acuta* and certain small pectens are characteristic.

The Blue Beds are followed (with a sandy clay parting in the Grantham district) by well bedded limestones named the

Little Ponton Beds, mainly somewhat impure oolites, with hard pinkish poorly oolitic limestone in the upper part. *Ptygmatis ("Nerinea") cotteswoldiae* is one of the commonest fossils, a large *Natica* occurs near the base, corals occur frequently, and ammonites of *discites* date have been found at various localities (identifications by Dr. Spath are mentioned below). A characteristic feature is the presence of worm borings passing down from the upper surfaces of many of the beds, filled with oolite of a different colour or coarseness from that of the surrounding rock. The Little Ponton Beds are overlain by the Cementstones—light yellow or white argillaceous limestones with scattered ooliths, in thin beds with partings of shaly clay. Fossils are generally less common than in the beds below, but species of *Pholadomya* occur widely with *Pinna* cf. *cuneata* and a new species of Terebratula (small, subsphaeroidal, with massive beak and broad simple fold), which is restricted to this part of the formation and forms a useful guide.

Above this is the most characteristic bed of the series—the *Crossi* Bed—usually 2-5 feet of partly oolitic light grey or buff limestone, frequently hard and splintery, which lithologically might be grouped as the highest bed of the Cementstones. The small spinose rhynchonellid *Acanthothyris crossi* is the characteristic fossil which gives its name to the bed, occurring with common *Lucina wrighti*, *Nerinea* sp. *Lima (Plagiostoma) rodburgensis* and corals. Several new species of Terebratula are present. At outcrop the bed can be traced without difficulty across arable land from the abundant casts of *Lucina* which weather out of it. The *Crossi* Bed marks the division between more or less impure limestone of variable character below, and purer oolites and rags above, divisions corresponding to the Kirton and Hibaldstow beds of north Lincolnshire. The brachiopod content of the bed indicates correlation with the *Buckmani* Grit of the Cotteswolds, of late-*discites* date.

The *Crossi* Bed is normally succeeded by the Ancaster Beds (the Hibaldstow Beds of the north) relatively homo-



DIAGRAMMATIC STRIKE SECTION

THROUGH

THE LINCOLNSHIRE LIMESTONE

BY P.E. KENT

SCALE

HORIZONTAL 1 INCH = 8 MILES
VERTICAL 1 INCH = 100 FEET

The horizontal line represents the base of the Great Oolite Series
Figures give total thickness of the formation in feet.

GREAT PONTON TEREBRATULA BEDS ..... D
GREAT PONTON GASTEROPOD BEDS C
ANCASTER BEDS IN SOUTH, HIBALDSTOW BEDS IN NORTH ..... B
CROSSI AND LOWER BEDS ..... A

geneous medium grained oolite, often true freestones, with *Nerinea*, small corals and brachiopods. The shelly Weldon and Clipsham beds are drawn as part of this series in the section, as there is at present no way of separating them, but it is not unlikely that they represent still higher beds transgressing on to lower horizons.

Higher beds than these are limited to synclinal areas, never having been deposited, or more probably removed by pre-Great Oolite erosion, elsewhere. The Ancaster Beds are succeeded by the Great Ponton Gastropod Beds and Great Ponton Terebratula Beds—each a series of richly fossiliferous bedded oolites with raggy beds, the former containing abundant gastropods and lamellibranchs, the latter a number of new species of brachiopods, some of which show resemblances to peculiar undescribed forms known in the basal Upper Inferior Oolite (*niortensis* zone) of southern England. The Terebratula Beds show little variation, but the Gastropod Beds pass into massive and well bedded limestones full of pebble-like calcareous nodules (a variety of pisolite). Probably a later part of the Terebratula Beds absent at Great Ponton are current bedded and massive oolites exposed in a freestone quarry on Houghton Hill, Grantham, which have yielded Terebratulae having affinities to Fullers Earth forms, and which may be representative of Upper Inferior Oolite.

Summarizing the present incomplete evidence of age, the lower half of the limestone belongs mainly to the *discites* zone (in the broadest sense)—early Middle Inferior Oolite—while the slightly transgressive upper beds presumably represent the later zones of the Middle Inferior Oolite, with the Great Ponton Terebratula Beds as probable Upper Inferior Oolite.

Lateral Variation.—The strike section figured shows the relative development of different beds of the limestone as followed along the outcrop. The total thicknesses are derived in most cases from well and borehole sections, while thicknesses of sub-divisions are mainly from measurement of open quarries.

The first part of the limestone to appear near Kettering is marly limestone with common "*Nerinea*" *cotteswoldiae*, corals, etc., (part of the Little Ponton Beds). A little to the north, however, they are cut out by the Weldon Beds, which rest upon an eroded surface of Lower Estuarine and include in their base pieces of the *Nerinea* limestone. These beds expand to 44½ feet at Pipewell. The lower beds come in again, and are well developed at Ketton — but still show from their bored upper surface that there was a pause in sedimentation before deposition of the Ketton Freestones, which represent the Ancaster Beds.

At Stamford the succession is more nearly complete. Sections do not now expose the full thickness, but the work of Sharp showed that the "Freestones of the Lings" rest upon a brittle limestone with *Acanthothyris crossi*, and that this overlies 49-50 feet of marly and crystalline oolite limestone with rich *Nerinea* beds. The total thickness varies from 65-75 feet. *Zeilleria wilsfordensis*, characteristic of the Ancaster Beds, occurs in the lower part of the Freestones.

At Castle Bytham a fine section shows approximately 35 feet of the Ancaster Beds with *Sonninia* sp., and brachiopods in the lower part, resting upon the *Crossi* Bed which yields the usual fauna. Four miles further west, at South Witham, the highest bed is a white oolite (seven feet exposed), in the lower part of which is *Acanthothyris crossi* with the delicate spines preserved, and Terebratulae resembling *Lobothyris buckmani* and *Tubithyris painswickensis*. These species support the inference from the *A. crossi* that the bed is equivalent to the *Buckmani* Grit of the Cotteswolds. Beneath is a thickness of 9 feet of white limestone, containing few ooliths, with partings of shaly clay. The facies of the beds and presence of a characteristic Terebratula show these to be Cementstones. Bedded oolitic limestones of the Little Ponton Beds are exposed beneath. The oolitic development of the *Crossi* Bed shows that the freestone facies is here at a lower level than usual, pointing to local absence of the break in deposition at the base of the Ancaster Beds.

A section at the Grimsthorpe inlier shows 20 feet of rather soft, pure bedded oolite above the normal *Crossi* Bed, with 10 feet of mainly oolitic limestone beneath containing *Lucina*, *Nerinea* and common small Terebratulae. Solid limestone has been proved for 18 feet lower still. Here there is no development of Cementstones as such, but they come in a little to the north.

North of Colsterworth, a quarry shows 8 feet of limestones of Cementstone facies with many fossils including the characteristic Terebratula in the lower part, beneath which are 18½ teet of oolitic limestones (sandy below), and 4 feet of ferruginous limestone possibly representing the Blue Beds at the base.

In the Great Ponton district the Terebratula and Gastropod Beds come in above the Ancaster Oolites. One of the first sections is at Corby, where a section shows 22 feet of raggy and pisolitic beds referable mainly to the Gastropod Beds. At Great Ponton the Terebratula Beds measure about 20 feet and the Gastropod Beds more than 15 feet (the top and base of the latter are seen in different sections so that their full thickness is doubtful). The Terebratula Beds are seen further west near Skillington—apparently 18 feet thick—and to the east, north of Ropsley, maintaining a thickness of 5 feet towards Newton, and resting on a locally channelled surface. The Gastropod Beds are still well developed and shelly at Humby (16½ feet plus), in Ropsley village, and at Stoke Rochford, but towards the north they pass into peculiar pisolitic and concretionary limestones, exposed to approximately 15 feet round Newton and Dembleby. The facies belts seem to be following the thickness changes in tending to lie east-west. At Ancaster the Gastropod Beds are apparently represented by the Rag, (overlying the Ancaster Freestone) which varies in thickness from 5 to 16 feet. The Ancaster Beds maintain constant lithological characters over this ground. At Little Ponton they measure 18 feet, with the beds below 38 feet, but as the limestone in the neighbouring district totals approximately 100 feet (of which 25 feet or less repre-

sent higher beds) these figures seem to be abnormally low, particularly as the extra development of higher beds at Great Ponton is accompanied by still further increase in total thickness (132 feet at Boothby Pagnell, two miles east). The section is therefore drawn assuming a thickness near Great Ponton of 30 feet for the Ancaster Beds and 50 feet for the beds beneath—figures suggested by well records to the north-east.

The *Crossi* Bed is well developed at Little Ponton, but seems to be absent between Wilsford and Welby, for three quarries show the Ancaster Beds resting directly upon Cementstones. That this is a reappearance of the nonsequence at the base of the former, rather than lateral passage, is shown by the occurrence of the Terebratula characteristic of the Cementstones at Scott's Quarry, Ancaster—for this species is replaced by other forms at the *Crossi* Bed level.

Over this part of the outcrop the lower beds are continuously well developed and the Little Ponton Beds have yielded ammonite evidence of *discites* date at Waltham, (*Euhoploceras* sp.) and at Spittlegate Reservoir, Grantham, (*Fontannesia* sp.). The latter occurred at the horizon of (probably immediately above) a thick parting of grey silty clay and clayey sand, which, as the late Mr. A. E. Musgrave first observed, has a wide extention in the country near Grantham immediately above the Blue Beds. At Denton the Little Ponton Beds include a marly limestone development with abundant *N. cotteswoldiae*, small corals, etc., which yielded a big fauna to early workers. At Waltham these beds are overlain by bedded white oolites. The presence of Collyweston Beds has been suspected at a number of localities, and Mr. Richardson has recently recorded the finding of *Gervillia acuta* and *Pinna cuneata* in basal fissile limestone at Ancaster. There is an old record of "*Pterocera*" *bentleyi* at Denton, and the writer found the same form in an oolitic development of basal beds at Buckminster. The Collyweston Beds, however, are rarely more than 1 foot thick hereabouts, a much reduced representative of the bed in the south.

Near Scopwick and Metheringham there are various good sections in the upper beds—even-grained current bedded oolites with large *Nerinea* and isolated Terebratula valves, overlain by shelly oolites with lenticles of pisolitic limestone in which numerous *Nerinea* and corals (including *Anabacia*) occur coated in lime. The latter may well be a representative of the Great Ponton Gastropod Beds. A shallow boring record near Scopwick gives an incomplete thickness of 52 feet for the upper part of the limestone with 42 feet of Cementstones and Little Ponton Beds beneath. Near Metheringham the lower beds maintain the same thickness, and the full thickness of the upper part is 47 feet.

South of Lincoln the *Crossi* Bed is particularly rich at Green Man Wood Quarry, and is clearly marked in the Nocton district, where it is separated by 3 to 4 feet of shale (containing *A. crossi* at Washingborough) from the overlying Ancaster or Hibaldstow Beds. This thick shale bed (which contains impersistent argillaceous limestones locally) is a persistent band, recognisable near Lincoln, northwards to Welton, and probably passing into the Kirton Shale. It serves for separation of Hibaldstow from lower beds in section records. At Nocton, corals up to 6 feet across occur in the *Crossi* limestone and project into the oolite above.

The Cementstones are exposed in many places—notably the railway cuttings near Nocton (12-15 feet), Boothby Graffoe (12 feet plus), the Greetwell quarries and the Lincoln Dean and Chapter quarry (17 feet, probably complete). The characteristic Terebratula has been found at several localities in the upper part. The Little Ponton Beds are seen in the railway cuttings (18 feet) and in the extensive quarries east of Lincoln (16 feet). At Greetwell several species of *Hyperlioceras* (indicating an early *discites* date) have been recovered from the Silver Beds, 8 to 10 feet above the base of the stone. Details of Dr. Spath's identifications for this and other localities were given in these Transactions for 1937.

North of Lincoln, open sections are less common, but water borings have proved useful. At Welton, for example,

the Kirton Shale serves to separate the major subdivisions—the Hibaldstow Beds measuring 23 feet, the beds below 45 feet. Near Spital, various old sections show argillaceous limestones with thick shale partings in what should be the upper part of the limestone, and a boring at Glentham proved this to be due to cutout beneath the Great Oolite, which rests directly upon the *Crossi* Bed, with the Hibaldstow Beds completely overlapped. A well record provides a strong indication that this condition extends as far south as Spridlington—a point which requires confirmation, but would account for the narrowness of the limestone outcrop thereabouts.

A fuller development appears again, however, and the middle part of a thick sequence is exposed in the Kirton tunnel quarries. Here the Hibaldstow Beds overlie an oolitic Cementstone with *A. crossi*, etc., which rests upon 16 feet of yellow or grey shaly clay (the Kirton Shale), unfossiliferous above, with local cementstone bands, containing richly fossiliferous large concretions in the lower part, with *Ostrea* and corals in abundance, also *Acanthothyris*. Hard grey argillaceous limestones with thin shale partings exposed beneath belong to the Cementstones. Probably the whole of the shale, with the basal bed of the oolite, represents the *Crossi* Bed of the south, which has already been seen to pass into the cementstone facies at Lincoln with considerable thickening. The lower beds moreover, are expanded in the same way (although not so greatly), for boreholes in 1938 proved up to 58 feet of limestone with shale below the Hibaldstow Beds at neighbouring localities.

The Hibaldstow beds are still exposed in the village which gave them their name, and the total thickness of limestone thereabouts has been shown by recent borings to be usually 91-94 feet. The thickening in this district was quite unexpected after the attenuation at Lincoln and Spital.

North again, in the Brigg-Broughton-Appleby area, there is a wealth of boreholes which have yielded most useful data. The Kirton Beds (using the term to cover the lower half of thel imestone) show a constant thickness of about 40 feet of

argillaceous limestones, with scattered ooliths, parted by shale bands, which are thin above but prominent in the lower part. In the Appleby syncline rather unsatisfactory records suggest a thickening as near Kirton. *Trigonia hemisphaerica* var *gregaria* is one of the commonest fossils in the upper part of the Kirton Beds, and locally the *Crossi* Bed is present as 2 to 3 feet of argillaceous limestone, with the zone fossil and *Galeolaria (Serpula) socialis* common.

Upon a piped and channelled surface of these lower beds rests the Hibaldstow Oolite (the erosion surface probably accounts for the abovementioned discontinuity of the *Crossi* Bed), which varies very rapidly in thickness in short distances. Near Wressle it is absent in two places (Great Oolite resting on Kirton Beds), but it thickens to 30 feet within a mile. The thickness variation seems to be related to small N.W.-S.E. folds.

The shales in the lower part of the Kirton Beds are sandy near Broughton, and a borehole at Scotney shows that the sandy facies reaches higher horizons further north—from a short distance below the *Crossi* Bed the formation is sandy, fucoidal and locally ferruginous, and the argillaceous limestones are separated by thicker shale beds. The individual beds, at the same time, can be traced back into the limestone and shale of Broughton, which is the normal Kirton facies. The development invites direct correlation with the so-called Lower Estuarine of Elloughton and Brantingham beyond the Humber. Supporting evidence of this relationship was provided by discovery at Newbald in 1938 of *Acanthothyris* close to, if not identical with, *A. crossi*, in a thin shale bed at the base of the Cave Oolite, suggesting that the latter is equivalent to the Hibaldstow Beds only, with the clays, sandstones and limestones beneath representing the Kirton Beds.

Thus the lower half of the Lincolnshire limestone passes from oolites in the south by the incoming of argillaceous limestone to a cementstone facies in north Lincolnshire, and there is good reason to believe that this passes into "Estuarine" beds near the Humber. Intra-Inferior Oolite erosion greatly

affects the thickness of this part of the subdivision in the south, but has played only a very minor role in mid and north Lincolnshire.

The upper part of the limestone, on the other hand, maintains relatively constant lithological characters, but its thickness variation depends mainly on the amount of erosion in pre-Great Oolite times, so that the fullest development is found in the synclines, with great attenuation on lines of uplift.

Report of the Hon. Secretary and Treasurer, 1940.

Owing to the cancellation of Field Meetings on account of the War, the Secretary's report is unfortunately brief. With great reluctance and regret it was decided, owing to the uncertainty of conditions, to suspend the programme of Field Meetings that had been arranged for the Summer. The notice of the first meeting, which was to have been at Freshney Bog on 25th May, was printed and ready for circulation when the grave turn in the War occurred in May. After consultation with available officers of the Union it was decided to cancel the meeting and to suspend meetings until conditions improved. Unfortunately, conditions did not become sufficiently settled to allow meetings to be resumed.

The appeal for continued support through subscriptions brought an excellent response as a result of which it was possible to publish "TRANSACTIONS, 1939", together with a list of members. Subscriptions, in excess of membership fee, to the Publication Fund have this year reached a record total of £8 10s. 0d. This has materially helped towards the cost of our publication and has secured an excellent interim balance of £18 10s. 8d. in the General Fund.

Membership has been well maintained in face of the many changes and difficulties of the year. There have been resignations and losses by death, but the present membership

figure is 214; a decrease of 7 on last year. Six new members have been elected during the year:

Mr. A. E. C. Chambers, 36 Watergate, Grantham.
Mr. R. N. Cornwallis, Collow Abbey, Wragby.
Mrs. G. Drummond, 27 Yarborough Crescent, Lincoln.
Mrs. M. Fletcher, Donington Park, Spalding.
Miss M. Goodrich, Corby Vicarage, Grantham.
Mr. H. W. Gover, 44 Squadron, R.A.F., Waddington.

It is with great regret that I record the death of one of our original members who was also a past President of the Union. Mr. Henry Preston, of Grantham, who died in July, joined the Union on its inception in 1893. Mr. Preston will always be remembered for his contributions to the study of Geology and particularly in its relationship to water supply. He was responsible for much pioneer work on local geological problems. So wide was his knowledge and his contributions to Lincolnshire natural history so many and varied, that it would be impossible to give a summary here. A biographical sketch of his life was published in "TRANSACTIONS" 1912, and the writer opened his account by stating: "No President of the Union has been a busier worker than the occupant of the chair in 1903-4". These were not words of flattery, for Mr. Preston was always seeking to further the interests of the L.N.U. and to impart to others his vast store of information on many subjects of local interest. He was the means of introducing many members not only to the ranks of the L.N.U. but also to the marvels of Nature that had made such deep impression on his mind. Health had not permitted him to take an active part in the Union's activities in recent years, but his loss will be keenly felt, the wisdom of his advice missed and a further link with the early days of the Union severed. It is with regret also that I refer to the death of the Venerable Archdeacon H. T. Parry of Bigby, a member from 1916, who took a keen interest in our activities; of Mr. J. F. Wintringham of Grimsby, and Sir George E. Moody of Cleethorpes, both members from 1916, who although not taking an active part in the work of the Union were regular subscribers, and of Mr. C. W. Dixon of Grimsby, a member from 1930.

Sectional Officer's Reports.

BOTANY.

Miss E. J. Gibbons.

Nothing very much has been sent to me in the way of botanical records this year, and there being no field meetings I have much less to report.

Two members sent in accounts of a pleasant day in the Alford district, but though spending a profitable time to themselves, the ground was already well worked and any rarities had been previously recorded. Other members have had less time and opportunities for search owing to war work and difficulty in travelling.

Several casuals have occurred. *Campanula persicifolia* at Torksey as a possible garden escape. *Hemizonia pungens* at Gainsborough. This alien was found at Limber in 1932 on a chicken run at a field meeting. It has an attractive yellow flower. A large plant of *Datura* (Thornapple) came up on an allotment at Caistor. It had 28 of the large prickly seed vessels. As it was growing close to the new by-pass road, it has been suggested that the seed had been brought to the surface by excavation and carried on someone's boot into the adjoining garden. *Impatiens parviflora* has been observed in two previously recorded habitats.

Owing the extraordinarily severe winter, plant life was late in beginning to grow, nothing was able to flower before the beginning of March, but all soon made up for lost time. Many shrubs flowered very profusely and there was no frost in May to cut the buds. The hot weather in June hurried flowers on and dried them up quickly, but later flowering plants went on well into the autumn as the weather was not hot.

A newspaper article on the drying of herbs roused me to collect what I could with very little time to spare at the end of the summer. Owing to the impossibility of importing herbs for medicines there is a shortage which ought to be

made up by botanists in this country. Some plants should be collected with care so that they are not exterminated, but others like nettles, dandelions and coltsfoot no one would miss. The process of drying must be done with care and if members could combine to collect larger quantities next year to be sold in one consignment, it would be more worth while.

New district records for 1940 are:—

	Division.	
Beta maritima	12 & 17	Mr. R. Wells
Echium vulgare	11	Mr. A. E. Smith
Equisetum maximum	13	Miss J. Gibbons
Mentha alopecuroides	15	Miss D. Thackeray
Potamogeton praelongus	16	Mr. H. Burchnall
Senecio squalidus	16	Mr. H. Burchnall
,, ,,	15	Mrs. B. Welch
,, *viscosus*	15	Miss D. Thackeray
Silaus pratensis	12	Mr. R. Wells
Valeriana officinalis	11	Mr. A. E. Smith
Glaucium corniculatum	10	Mr. R. Wells

ENTOMOLOGY.

F. L. Kirk, B.Sc

Although conditions have not allowed members to take full advantage of it, this season has been a very good one for insects.

An interesting find was the Musk Beetle (*A. moschata*) at Donington on August 11th. This is a handsome longhorn beetle which emits a powerful scent like sweetbriar. It is found on old willows.

During November, hibernating Queen Wasps were discovered in curious places. Two were inside a sponge and a third had concealed itself in a steel box-spanner with its head through the hole for the tommy-bar.

Butterflies.—Most of the butterflies found in Lincolnshire appear to have been more plentiful than usual.

From Threekingham Captain Cragg sent two records of the Comma (*P. c-album*) at the end of June and beginning of

July. Miss E. J. Gibbons noted it at Holton-le-Moor on March 24th and again on July 14th. This species has also been reported from Well Vale by Mr. A. E. Smith; Market Rasen by Mr. T. H. Court; Hurn Wood by Mr. A. E. Chambers; Woolsthorpe by Miss Senescall in August, and at Donington. Later, Mr. Smith sent two further records of the Comma and Mr. Chambers of more than twenty on fallen fruit at Folkingham.

The White-letter Hairstreak (*S. w-album*) was recorded by Miss E. J. Gibbons at Holton-le-Moor. This species was was also seen at High Wood, Rauceby on July 20th, but storms prevented me from observing whether it was well established there. Canon H. E. Stancliffe sent word that the species frequented Shasta Daisies at Belton.

I am tempted to quote Mr. Chambers' letter as a model set of records: "Silver Washed Fritillary (*A. paphia*) August 15th, Hurn Wood. One seen in perfect condition and strong on the wing; obtained a good view with the field glass of both opened and closed wings while settled on flower head of spear thistle. Comma (*P. c-album*) August 18th. One settled on small patch of bare ground in main ride of Hurn Wood and remained thus for some minutes until disturbed; condition perfect, upper side brilliant. Speckled Wood (*P. aegeria*) August 18th. Hurn Wood. One in perfect condition. The Wall Butterfly (*P. megera*) appears to be unusually common this year".

The High Brown Fritillary (*A. cydippe*) was fairly common in July and early August at Swinn Wood, Mother Wood, Tothill Wood, Muckton Wood and Well Vale. These records were communicated by Mr. A. E. Smith. Mr. C. G. Else also recorded this species at Grasby Bottom on 4th August.

An unexpected record was the Speckled Wood (*P. ægeria*) in my garden at Donington. I always thought that this butterfly was restricted to woods. We have no woods near Donington and the nearest Speckled Wood I have seen before was at Mareham Lane about ten miles away. The specimen appeared to be exhausted and a gale was blowing at the time

so that it had probably been blown some distance from its usual haunts.

I have only seen one Painted Lady (*V. cardui)* this season, but that may be due to restricted opportunities. Mr. A. E. Smith confirmed that the Painted Lady had been scarce. Red Admirals *(V. atalanta)* were extremely common in gardens, attracted by the large amount of fallen fruit.

Three members have sent me detailed reports of their observations. At the end of July Mr. T. H. Court visited a locality near Market Rasen crowded with butterflies. White-letter Hairstreaks (*S. w-album*) were in profusion though not in perfect condition. There were six Commas including one *Hutchinsoni* variety. Other butterflies were the Peacock (*V. io*), Small Copper *(L. phlaeas)*, Ringlet *(A. hyperanthus)*, Small Tortoiseshell *(V. urticae)*, Dark Green Fritillary *(A. aglaia)*, Silver Washed Fritillary (*A. paphia*), Gatekeeper (*M. tithonus*), Small White *(P. rapae*), Green-veined White (*P. napi*), Large White (*P. brassicae*), and Meadow Brown (*M. jurtina*). Later, the Brimstone (*G. rhamni*) was seen at the same place. In addition the Comma was found to be plentiful at another part of the Rasen district as well as Small Tortoiseshells, Peacocks, Red Admirals, Brimstones and Wall Browns; there was one Painted Lady (*V. cardui*).

Mr. M. W. Graham sent me a report from the Old Bolingbroke district, and this is appended in full: "On account of current events one's work naturally has been much restricted and I have not been able to make many observations. The Large White (*P. brassicae*) has been exceptionally abundant here in its summer brood, and has swarmed everywhere, in gardens, cornfields, clover and by roadsides. This brood persisted until late September. Probably its numbers were much augmented by immigration. [It may be noted that, in a recent number of a periodical, Mr. W. P. Pycraft records the occurrence of migrant swarms of Cabbage Whites on the S.E. coast during July, but which species, however, is not stated.] As far as I have observed, neither *P. rapae* nor *P. napi* has been particularly common this season. Other

species noted as being exceptionally abundant were the Small Copper (*L. phlaeas*) and the Wall (*P. megera*). Some kinds appeared very early—a female of (*P. brassicae*) was seen on April 25th, one of the earliest dates I can recall; and males of the Meadow Brown on June 9th. The Green Hairstreak (*C. rubi*) occurred here in June, and the White-letter Hairstreak (*S. w-album*) in July. The latter must have been fairly common, as I only encountered it casually without looking for it. I could not look for the Holly Blue (*L. argiolus*) in Spring, but by chance I noticed examples of the second brood on August 25th and 30th. Although its habitat had been disturbed, the Brown Argus (*A. agestis*) still flourishes at Woodhall Spa. On the same day that I looked for it at Woodhall I also found another colony near Coningsby, where it was decidedly commoner, and the specimens very fine; I noticed that some of them had the discoidal spot on the upper surface partially encircled with white scales. I could not collect during the latter part of the season and so have only one record of the Painted Lady, for August 17th. Miss C. Massie informs me that she saw another at Skegness on September 21st. It is perhaps worth noting how common hibernating specimens of the Tortoiseshell (*A. urticae*) have become; all the individuals in question came indoors at the end of July and in early August".

Mr. C. G. Else of Barton-on-Humber sent a valuable list of records for that district. Space will not permit the publication of this in full but many additional records have been added to the County list.

Moths.—The Hawk Moths have been much in evidence. Pride of place must be given to the Bedstraw Hawk Moth (*D. galii*). This was recorded from Lincoln by Mr. R. J. Mason who saw it alive after its capture by a neighbour about June 1st.

Death's Head larvae (*A. atropos*) has been remarkably abundant. Mr. F. Kime had 3 larvae from Freiston shore in in August and sent word that many more had been killed there. During July larvae were found at Donington, Nor-

thorpe, Billingborough and Brothertoft, and the moth itself was captured at Billingborough on May 16th.

In the Donington district there were quite a number of Elephant Hawk larvae (*C. elpenor*); a full-fed one on July 25th pupated during the next few days, making a very open net-like cocoon. A month later, August 26th, another larva was brought to Donington, showing the wide time variation exhibited by this species in its life history.

The Humming Bird Hawk Moth (*M. stellatarum*) was sent by Mr. Kime from Kirton on September 27th, the only record sent in for this moth this season.

The Lime Hawk (*S. tiliae*) occurred at Donington on May 28th and again on June 8th, whilst larvae were seen in the early part of September.

An Eyed Hawk (*S. ocellatus*) was brought from Billingborough on May 27th and a Poplar Hawk (*S. populi*) was taken at Donington on June 7th. Mr. Rimmington Wells also sent a Poplar Hawk from Boston.

Among several interesting items from Barton-upon-Humber, Mr. C. G. Else sent word that the Eyed Hawk had been crossed with the Poplar Hawk and a number of pupae obtained.

Records of other moths include the Puss Moth (*D. vinula*) at Donington on May 17th; Fox Moths (*L. rubi*) at Market Rasen, May 5th; Beautiful Yellow Underwing (*A. myrtilli*) and many Geometers on tree trunks (*crepuscularia, etc.*) at Market Rasen, May 19th; in the same district Foresters (*P. statices*) in rather worn condition on July 29th.

Mr. Kime reported the Red Underwing (*C. nupta*) at Boston on August 29th, and Mr. Else at Deepdale, Barton-on-Humber, in September.

Mr. R. K. Cornwallis informed me that the Scorched Wing (*M. dolabraria*) was fairly common at Wragby, and two specimens of the White-pinion Spotted (*B. bimaculata*) were found on May 29th at Legsby.

I wish to thank all the members who have so kindly supplied me with information in spite of present difficulties.

CONCHOLOGY.

J. F. Musham.

The lack of Field Meetings, together with restricted means of travel, has deprived some of us of the stimulus usually associated with these advantages; still, the year has not been an entirely idle one.

In division 16 S.W. Miss Catherine Stow with her usual thoughtfulness has not forgotten this section ; from Tallington, near Stamford, she has submitted *Cepaea hortensis* with its subvar. *pallida* Chll, (a record new to this area for this locally scarce colour form), also *Theba cantiana*, *Hygromia striolata*, *Xerophila virgata*, *Cochlicopa lubrica*, and has seen *Arion ater* and *Arion flavus*, together with *Helix aspersa* and *Arianta arbustorum*, expressing the opinion that these well known species are possibly the first record for Tallington in particular.

Although greatly hindered, the work on the tufaceous deposit in North Lincs. is being continued with assiduity by Mr. C. F. B. Shillito and Mr. J. Beveridge, and the usual prolific results have again been obtained from a further outcrop at Scawby. The first trial hole was lifted on June 14th, 1939, but after washing, sorting into species and verifying, was too late for inclusion in that year's report. It yielded, however, 8484 specimens comprising 49 species, including 18 examples of *Vertigo lilljeborgi* Webster, a new County record and incidently its first occurrence as a fossil in Great Britain; together with such "good things" as *Vertigo genesii*, *V. concinna*, *V. moulinsiana* and *Retinella petronella*, *Goniodiscus ruderatus*, *Spasmodia lamellata* were as usual numerous, thus confirming the fact that numerically our deposit has no equal in the country.

Hole No. 2 was raised during April of this year and produced 8189 specimens with again 49 species, but lacking *V. lilljeborgi*, the other species being similar to No. 1.

Hole No. 3 was sampled in August following; this material is now washed out and sorted into species totalling 9286 specimens. It includes *Limnaea glabra* (always rare in a fossil state) our previous record was at Westwood Lodge in

1937. It is a shell still found alive in the north of the County not far away. This lot is now awaiting more tranquil times before further details can be ascertained, still leaving two lots at Scawby to be lifted when circumstances permit.

It may be interesting here to note that to date 90 species, of which 11 form New County Records, have been extracted from this remarkable deposit. Since 1936 the investigation has been thorough throughout, nothing has been overlooked or time spared in careful washing, separating and counting. Again our best thanks are extended to Mr. A. S. Kennard for his valuable time and help in their verification.

SOME NOTES ON THE ECONOMIC ZOOLOGY OF LINCOLNSHIRE DURING 1940.

A. Roebuck, N.D.A., F.R.E.S.

With the ploughing up of still more grassland the outstanding insect pest of the season has been the wireworm. These have caused most damage to cereals; less upon roots, including potatoes and only slight damage to pulse crops such as peas and beans. A rough guide to the relative abundance of the pest species was obtained by noting those adults still in the turves when sampling fields. For the area comprising Lindsey and Kesteven, *Agriotes obscurus* was roughly twice as abundant as *A. sputator* and the latter was twice as abundant as *A. lineatus*. *Athous* and *Corymbites* species were present in relatively small numbers.

Cereals.

The larvae of the Mud Beetle (*Helophorus nubilis*) occurred in the Horncastle district damaging young wheat. Frit Fly (*Oscinella frit*) damaged young wheat in the Isle of Axholme and the fly, *Opomyza germinationis*, caused similar damage at Thornton Curtis. The Wheat Bulb Fly (*Leptohylemyia coarctata*) was generally distributed but nowhere abundant. Gout Fly of Barley (*Chlorops taeniopus*) was scarce. At Norton Disney a field of oats was considerably damaged by being undermined

by moles. The aphis, *Macrosiphum granarium* was fairly general on the ripening cereals.

Pulse Crops.

The most noteworthy pest upon these crops was the eelworm *Anguillulina dipsaci.* This did considerable damage on fields near Fillingham. The weevil *Sitona lineata* did slight damage on pea and bean fields.

Brassica Crops.

The Large White Butterfly (*Pieris brassicae*) was extraordinarily abundant and did much damage. The adults were plentiful by May 8th and both broods were abundant. Derris dusts and sprays as well as a soap-salt spray were very effective in combating the larvae. Cabbage Root Fly (*Delia brassicae*) did much damage- Its attacks were very severe in the Kirmington district.

Potatoes.

By far the most abundant aphis was *Aphis rhamni. Myzus persicae* and *Macrosiphum gei* were present in small numbers. The eelworm *Anguillulina dipsaci* caused much damage to the stored crop in places in the south of the County. The Potato Eelworm (*Heterodera Schachtii*) is the worst pest on this crop. It is hoped that fields will not be too intensively cropped with potatoes, even in war time, otherwise this pest will increase in intensity and extend its range.

Sugar Beet.

There were some severe attacks by the Black Aphis (*Aphis fabae*) on crops in the Newton district. In the same area there were attacks by the Beet Carrion Beetle (*Silpha* sp.). The Mangold Fly (*Pegomyia hyoscyami* var. *betae*) first appeared on June 2nd. This appears to be more usual on the Wolds than in other parts of the County.

Miscellaneous Crops.

In view of the increasing cultivation of flax or linseed the appearance of the tortrix moth *Cnephasia* (*Sciaphila*) *virgaureana* Tr., spinning the leaves together and feeding on the tips, is

noteworthy. It appeared at the end of May but did not do much damage. Lettuces suffered extensively from aphis attacks in the late season by two species. *Myzus lactucae* feeds upon the currants until the end of June and then enters the hearts of the lettuces. *Pemphigus bursarius* forms galls on the petioles of poplar leaves and afterwards attacks the roots of the lettuces The aphis *Anuraphis robusta* occurred splitting the roots of parsnips at Lincoln.

A very curious and widespread attack by *Apion apricans* occurred for a short time near the end of July. These weevils, presumably migrating from clover crops in large numbers, attacked the foliage of any and every crop in gardens and allotments.

The mite *Rhizoglyphus echinopus* occurred in abundance on some bulbs received from Lincoln. The very large tick *Hyalomma syriacum* was received from one or two places from Tortoises. This appears to have been imported frequently in recent years with Tortoises from the Mediterranean region. It is interesting to record the great abundance of the weevil *Hypera rumicis* which, in the larval stage completely defoliates docks. The adults emerged from their transparent parchment like cocoons during the last week of June.

Trees and Fruit.

The Sawfly (*Eriocampoides limacina*) did damage to Pear trees in parts of Kesteven. The Gooseberry Sawfly (*Pteronidea ribesii*) defoliated bushes by May 16th in some places.

The foliage of beeches was damaged extensively by the weevil *Rhynchaenus fagi* and the moth *Lithocolletis faginella*. *Lithocolletis acerifoliella Z.* (= *sylvella* Haw) was widespread upon Sycamores. The larva cuts perfectly circular discs from the underside of the leaves and falls to the ground in these to pupate. The scale insect *Fonscolombia fraxini* was found migrating on the trunks of ash trees at the end of October. This is not so abundant or so noticeable as the common scale *Chionaspis salicis*. The leatherjacket of *Tipula flavolineata* was received at the end of May feeding in a rotting tree trunk,

The very large aphis *Pterochlorus longipes* Dufour occurred in abundance on oaks is Troy Wood, Coningsby. This works in very close association with the Wood Ant, *Formica rufa*. The latter species forms very large ant hills in this wood.

ORNITHOLOGY.

S. A. Cox.

My ornithological notes for 1940 are, I regret to say, far less copious than usual, for access to coastal districts is now very limited and there are restrictions also in other favourite haunts. My leisure moments, too, have been severely curtailed, but amongst other places I have visited Croxby Pond on several occasions, and the brief hours that I have spent there have seemed doubly enjoyable.

The arctic conditions which prevailed throughout January and a great deal of February brought many interesting wildfowl to our inland waters, but these have already been recorded in the last issue of "Transactions". February 16th was the coldest day at Grimsby with eighteen degrees of frost, but a few miles inland it was much colder. Of our commoner birds Song Thrushes suffered most severely, and even at the end of September, owing to their continued scarcity, rowan berries were still hanging untouched on the trees. In my own garden it was the Missel Thrush, a comparatively rare visitor, which eventually finished them off. Dunlin left the coast and haunted the few becks that were not ice-bound. A drain at Old Clee was choked with Canadian Waterweed and both Dunlin and Snipe fed on the water-snails with which the plant was infested. For much of the arctic period the sky was completely overcast and the wind blew from every point of the compass, but the frost still persisted, and on the evening of February 9th we saw the stars for the first time for three weeks.

The thaw set in on February 20th, and two days later, with the thermometer at 44 degrees F., it seemed almost as warm as summer and the first Song Thrush was heard singing.

On February 23rd the thermometer reached 50 degrees and the Lark and Blackbird joined the chorus. The Wren and Chaffinch were heard on the 24th, followed by the Missel Thrush and Reed Bunting on the 25th, by which time only slight traces of snow still persisted.

The Yellowhammer began to sing on March 8th, and on the 13th I saw the last Geese, eight of them, winging their way to the far north. The Corn Bunting began to sing on March 16th and the Goldcrest on March 22nd. Redwings were seen for the last time on March 23rd.

March 24th was the first real day of spring, for the Chiff-Chaff returned and we saw the first Long-tailed Tit's nest, but the sight of a belated Woodcock reminded us that winter was not yet past.

The Willow Warbler appeared on April 15th at Croxby Pond, but on the following day Bramblings still persisted in their winter haunts. A Swallow was seen on the outskirts of Roxton Wood on April 20th.

The Grasshopper Warbler appeared at Limber on April 21st, our earliest record for seventeen years, and there was a Tree Pipit at Caen Hill. Grasshopper Warblers were less plentiful than in some recent years, but I subsequently heard them at Swallow Vale and Croxby Pond, both new localities for the species.

Migrants were now swarming in the fields and woodlands, and during the next week Whitethroat, Cuckoo, Sedge Warbler, Turtle-Dove, Lesser Whitethroat and Yellow Wagtail followed each other in quick succession. The Turtle Dove made its earliest appearance for eighteen years.

On May 4th the Nightingale appeared at Swallow Vale and probably nested, for it was still singing there on June 15th. This is a new Lincolnshire haunt and incidentally my only record for 1940. The Garden Warbler was also heard.

On May 13th I saw the first House Martin at Scamblesby, the Spotted Flycatcher at Woodhall Spa and Swifts at Tattershall.

On June 2nd I saw the nest of a Great Spotted Wood-

pecker in a Spanish chestnut at Croxby Pond. The young had just hatched. A week later at the same place I saw the nest of a Bullfinch. It was well hidden in a young Scots pine, four feet from the ground, and contained four young.

The Cuckoo continued to call long after the end of June, but only in the dawn chorus, a phenomenon with which my A. R. P. duties made me increasingly familiar. I last heard it on July 13th—the latest date I have ever heard a Cuckoo calling.

Young Sparrow-Hawks were mewing at Croxby Pond on August 15th and the sound brought back pleasant memories of the year 1932 when we conducted our Sparrow-Hawk census and located sixteen nests. During an "alert" at Grimsby on August 21st I saw my last Swift.

The Ring Dove is noted for late nesting, and I was, therefore, not surprised to find a nest and eggs in a yew at Croxby on September 8th. I heard a Missel Thrush singing as it gorged on Rowan berries on September 20th.

Swallows were last seen on October 7th and on the 13th the Grey Wagtail appeared. Redwings were heard passing by night on October 18th and on the 22nd the first Wild Geese were calling in the fog.

From Holton-le-Moor Miss Joan Gibbons sends the following reports:—The Spotted Flycatcher, always one of our earliest spring arrivals, was even tardier than usual, and arrived a month late. Magpies, which have not been shot since 1916, are increasing and extending their territory. Formerly there were few or none at Holton, though the species was always plentiful at South Kelsey.

Miss Mary Gibbons reports that the Lesser Spotted Woodpecker still persists at Holton-le-Moor, one of its few haunts in the county, and that the Great Spotted Woodpecker has been observed as usual.

Mr. R. May, like myself, has not wandered far afield this year, but his notes from Limber and Brocklesby are very interesting.

On January 7th he saw 30 Tufted Duck, 40 Pochard, a

Scaup, 2 Shovelers and a Goldeneye on Newsham Lake. The previous week had been bitterly cold. In similar weather on January 19th there were about fifty Bramblings feeding in a stackyard at Little Limber Grange. Snow accompanied the severe weather during the last week of January and Gulls of three species visited Mr. May's garden—Herring, Common and Black-headed. On January 30th a pair of Mallard were seen to fly from a corn stack in open fields at Pimlico. Goldeneye were seen for the last time at Newsham Lake on February 25th, and Whooper Swans at Lambert Hill on March 10th. Two Lesser Black-backed Gulls seen at Limber on March 18th were in full breeding plumage. Mr. May climbed to the Heron's nest which I reported having seen on March 24th—when he examined it a week later it contained five eggs, There were a pair of Shovelers on Lambert Hill on April 27th.

Reed Warblers were numerous at Mere Hill on July 7th, and two nests, probably second broods, were found. A visit to Scotton Common on July 21st was not quite so productive as usual, and although a Nightjar was seen, no "nest" was found. There were a few Shoveler on one of the "flashes", also a pair of Shelduck with a family of six. A Quail was heard calling in a field of barley at Limber on July 25th.

Two Green Sandpipers were seen at Lambert Hill on August 3rd, and two again at Mill Platts pond on the following day. Wheatears were less numerous than usual on autumn migration. I saw none, and Mr. May saw only one on August 13th. A belated nest of young Song Thrushes were launched into the world on August 30th.

A flock of Gulls seen on the wolds at Limber on September 15th included thirteen Lesser Black-backed. A party of at least 80 Golden Plovers were seen in a stubble-field on October 7th.

There were 2 Gadwall and 2 Shoveler at Newsham Lake on October 11th. The former seems now to be a regular but very scarce autumn visitor, and has probably in the past been confused with the duck Mallard. There were four Pintail on

Lambert Hill on October 14th, and eleven days later this number had been augmented by two fresh arrivals. A Stonechat was seen at Little Limber Grange on November 9th.

Two Goldeneyes, two Pintails and a few Shoveler were seen at the Brocklesby lakes on November 10th.

Snow Buntings normally appear on our coastal dunes before the end of October, and this autumn, for the first time since 1923, when I first made its acquaintance, war-time restrictions have caused me to overlook its arrival. Mr. May, however, noted it as far inland as Limber on November 15th.

Before concluding this brief report I would like to thank all members who responded to the circular sent out conjointly by Mr. A. E. Smith and myself early in the summer. The idea was thought out in more peaceful times, and we realised that we should receive fewer replies than under normal conditions. Nevertheless, the results have been very satisfactory and when classified should help to clarify the position as to the distribution of certain elusive species. Additional records will still be very welcome.

MEMBERS OF L.N.U. NOW SERVING WITH H.M. FORCES.

At the Annual Meeting it was resolved that for the duration of the War the membership of all persons serving with H.M. Forces should be maintained without the payment of an annual subscription. The Hon. Secretary will be most grateful to receive notification of such members. If the name and address is communicated he will be pleased to keep the member posted with information regarding the activities of the Union. The co-operation of members is invited in order that this record may be kept up to date.

F. T. B.

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